

# Technical Data for IS-Max **ISMS-Series** Mass Flow Meters

**0.5 sccm full scale through 5000 SLPM full scale**

Standard specifications. Consult Alicat for available options.



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| CERTIFICATIONS | MARKING  | CERTIFICATE        |
|----------------|--|--------------------|
| ATEX           | II 1G Ex ia IIC T4 Ga<br>T <sub>amb</sub> -20 °C to +70 °C | DEKRA 22ATEX0075X  |
| IECEX          | Ex ia IIC T4 Ga<br>T <sub>amb</sub> -20 °C to +70 °C       | IECEX DEK 22.0078X |

| SENSOR PERFORMANCE <sup>1</sup>                        |  |
|--|--|
| Mass flow accuracy <sup>2,3</sup>                      | Standard accuracy: ± 0.8% of reading and ± 0.2% of full scale<br>High accuracy: ± 0.4% of reading and ± 0.2% of full scale                             |
| Flow repeatability (2σ)                                | ± 0.2% of full scale   |
| Pressure accuracy <sup>2</sup>                         | ± 0.5% of full scale   |
| Flow measurement range                                 | 0.1 – 100% (1,000:1 turndown ratio)  |
| Operating pressure                                     | 11.5 – 160 PSIA  |
| Pressure sensitivity                                   | Mass flow zero shift and span shift: ± (0.08% of reading + 0.02% of full scale) per atm from tare pressure   |
| Temperature sensitivity                                | Mass flow zero shift and span shift: 0.02% of full scale per °C from 25 °C   |
| Temperature accuracy                                   | ± 0.75 °C  |
| Relative humidity accuracy <sup>4</sup>                | ± 1.8% RH at +23 °C (0% RH to 90% RH)  |
| Relative humidity temperature sensitivity <sup>4</sup> | 0.05% RH/°C (0 °C to +60 °C)   |
| Operating temperature range <sup>5</sup>               | -20 – 70 °C (ambient and gas)  |
| Totalizer volume uncertainty                           | ± 0.1% of reading in additional uncertainty  |
| Sensor response time                                   | < 1 ms   |
| Typical indication response time                       | Flow rate dependent and user-adjustable. As fast as (T63):<br>0.5 – 5 SCCM: 100 – 4000 ms<br>10 SCCM – 30 SLPM: < 10 ms<br>50 – 5000 SLPM: 65 – 255 ms |
| Typical warm-up time                                   | < 1 s  |

<sup>1</sup> Flow rate and pressure drop vary depending on process gas.

<sup>2</sup> Stated accuracy is after tare (for mass flow), under equilibrium conditions, includes repeatability and linearity.

<sup>3</sup> High accuracy mass flow readings only available on devices with a full scale range ≥5 SCCM and ≤500 SLPM.

<sup>4</sup> Relative humidity sensor is an optional feature.

<sup>5</sup> Low-temp FFKM required below -10 °C

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| MECHANICAL                       |  |
|----------------------------------|--|
| Wetted materials                 | 316L stainless steel, FFKM standard, FKM or EPDM as needed for some gases.   |
| Maximum pressure                 | Damage possible above 200 PSIA common mode pressure.<br>Damage possible by rapid pressure change above 75 PSI differential pressure. |
| Relative humidity range          | 0 – 95%, non-condensing  |
| Ingress protection               | IP66 rating<br>Dust-tight and protected against strong jets of water   |
| Mounting orientation sensitivity | None   |
| Mounting holes                   | 4× 6-32 UNC threaded $\nabla$ 0.276" [7.01 mm]   |

| POWER AND COMMUNICATIONS      |   |
|-------------------------------|---|
| Digital output options        | RS-232, RS-485, Modbus RTU and Alicat ASCII protocols   |
| Digital data update rate      | 40 Hz at 19200 baud   |
| Analog output                 | 4 – 20 mA   |
| Analog data update rate       | 1 kHz   |
| Analog signal accuracy        | ± 0.1% of full scale additional uncertainty   |
| Interactive display           | Monochrome LCD with integrated touchpad and backlight; simultaneously displays mass flow, volumetric flow, temperature, gauge pressure, and absolute pressure |
| Display update rate           | 10 Hz   |
| Electrical connection options | DB-15   |
| Power requirements            | See DOC-MANUAL-IS-SAFEINSTALLATION  |

| FEATURES                          |   |
|-----------------------------------|---|
| STP reference conditions          | 25 °C and 1 atm (default), user-configurable  |
| NTP reference conditions          | 0 °C and 1 atm (default), user-configurable   |
| Gas Select™                       | Up to 130 user-selectable gases stored internally. Each gas optimized to match NIST's REFPROP 10 gas property calculations across the operating temperature and pressure ranges for highest accuracy. |
| COMPOSER™                         | 20 user-definable gas mixes. Each mix may have up to 5 gases with 0.01% composition resolution.   |
| Multivariate process measurements | Volumetric flow, mass flow, absolute pressure, gauge pressure, barometric pressure, temperature, totalizer<br><b>Optional:</b> relative humidity  |
| Totalizer                         | Measure the total accumulated mass of a particular gas (or gas mixture) that has flowed in a process.   |

| RANGE-SPECIFIC TECHNICAL DATA |                             |  |
|-------------------------------|-----------------------------|--|
| Full scale flow               | Pressure drop at full scale | Default process connections <sup>6</sup> |
| 0.5—50 SCCM                   | 1.0 PSID                    | M5 x 0.8mm female                        |
| 100 SCCM—20 SLPM              | 1.0 PSID                    | 1/8" NPT female                          |
| 40 SLPM                       | 2.0 PSID                    | 1/8" NPT female                          |
| 50 SLPM                       | 2.0 PSID                    | 1/4" NPT female                          |
| 100 SLPM                      | 2.5 PSID                    | 1/4" NPT female                          |
| 250 SLPM                      | 2.1 PSID                    | 1/2" NPT female                          |
| 500 SLPM                      | 4.0 PSID                    | 1/2" NPT female                          |
| 1000 SLPM                     | 6.0 PSID                    | 3/4" NPT female                          |
| 2000 SLPM                     | 5.0 PSID                    | 3/4" NPT female                          |
| 3000 SLPM                     | 7.1 PSID                    | 1 1/4" NPT female                        |
| 5000 SLPM                     | 3.4 PSID                    | 1 1/2" NPT female                        |

<sup>6</sup> Consult Alicat for available connection options, such as: compression, face seal, push-to-connect, BSPP, SAE, or Swagelok®-compatible (VCO® and VCR®).

Ex Document. Any revisions must be submitted for review and approval by an Ex Appointee.

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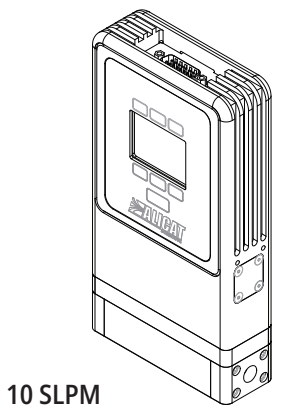
Standard specifications. Consult Alicat for available options.

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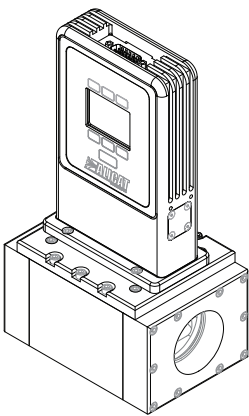


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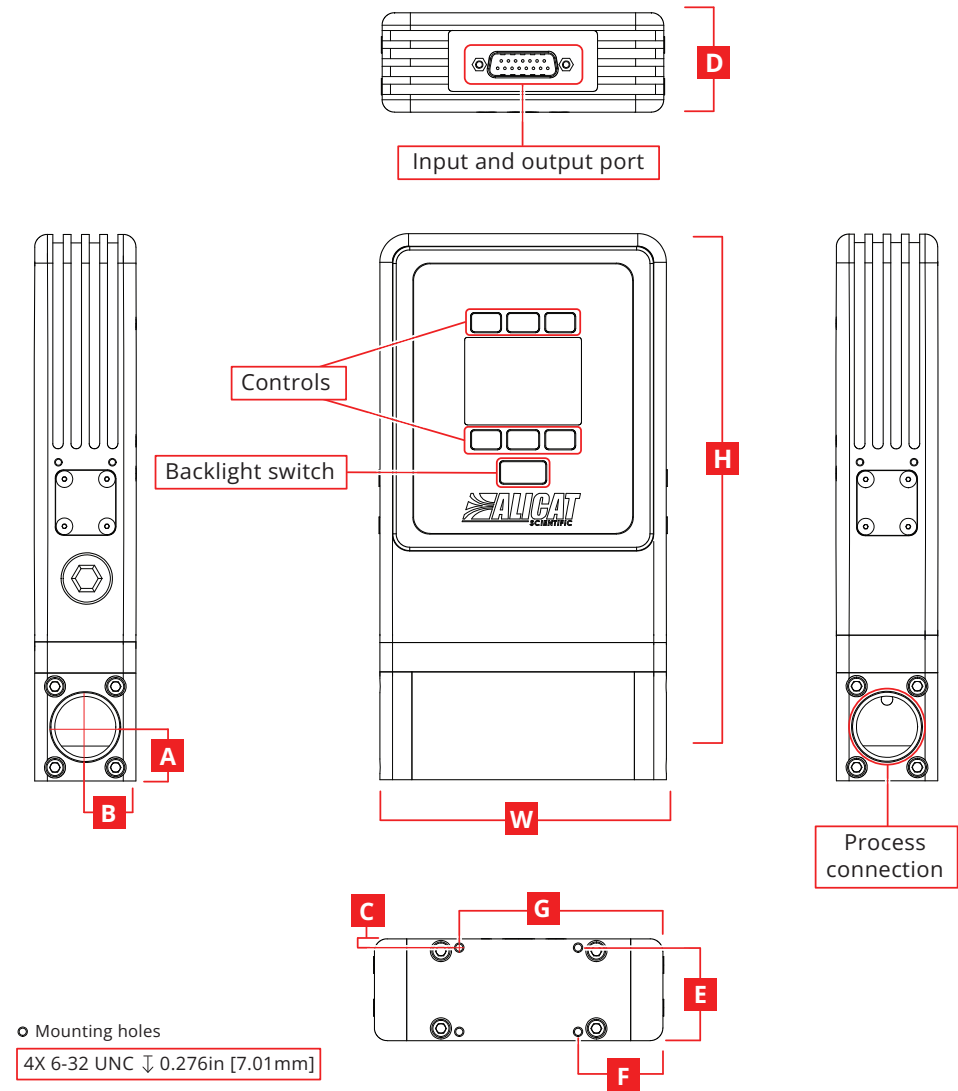
Representative Examples



10 SLPM



5000 SLPM



| DIMENSIONS         |          |         |          |         |         |        |         |         |          | WEIGHT    |
|--------------------|----------|---------|----------|---------|---------|--------|---------|---------|----------|-----------|
| Full scale flow    | Width    | Depth   | Height   | A       | B       | C      | E       | F       | G        |           |
| 0.5 sccm – 30 SLPM | 4.25"    | 1.50"   | 8.00"    | 0.50"   | 0.75"   | 0.13"  | 1.35"   | 1.25"   | 3.00"    | ≈ 5.0 lb  |
|                    | 108.0 mm | 38.1 mm | 203.2 mm | 12.7 mm | 19.1 mm | 3.3 mm | 34.2 mm | 31.8 mm | 76.2 mm  | ≈ 2.3 kg  |
| 50 – 1000 SLPM     | 4.25"    | 1.50"   | 8.60"    | 0.80"   | 0.75"   | 0.13"  | 1.35"   | 1.25"   | 3.00"    | ≈ 6.0 lb  |
|                    | 108.0 mm | 38.1 mm | 218.4 mm | 20.3 mm | 19.1 mm | 3.3 mm | 34.2 mm | 31.8 mm | 76.2 mm  | ≈ 2.7 kg  |
| 2000 – 3000 SLPM   | 5.20"    | 2.90"   | 9.16"    | 1.12"   | 1.45"   | 0.20"  | 2.70"   | 1.35"   | 3.85"    | ≈ 9.2 lb  |
|                    | 132.1 mm | 73.7 mm | 232.7 mm | 28.4 mm | 36.8 mm | 5.1 mm | 68.6 mm | 34.3 mm | 97.8 mm  | ≈ 4.2 kg  |
| 5000 SLPM          | 5.60"    | 3.84"   | 10.13"   | 1.45"   | 1.92"   | 0.30"  | 3.55"   | 1.55"   | 4.05"    | ≈ 16.2 lb |
|                    | 142.2 mm | 97.5 mm | 257.3 mm | 36.8 mm | 48.8 mm | 7.5 mm | 90.0 mm | 39.4 mm | 102.9 mm | ≈ 7.3 kg  |